

BEFORE THE INDEPENDENT HEARINGS PANEL FOR HUTT CITY COUNCIL

IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of the Hutt City Council Proposed District Plan

HEARING STREAM 6: Three Waters Chapter

STATEMENT OF REBUTTAL EVIDENCE OF:

Cristal Bennett

Senior Pou Whakamahere

Hutt City Council

10th September 2026

1.0 Introduction

My name is Cristal Bennett, and I am the Senior Pou Whakamahere at Hutt City Council.

1.2 I have reviewed the evidence and tabled statements of:

1. David Gibson for the Wellington Branch of Survey & Spatial New Zealand (S+SNZ) – Wellington Branch (submitter #466);
2. Timothy Michael Blackman for Tiaki Wai Ltd (formerly Wellington Water Ltd) (Submitter #422 and Further Submitter F36).

1.3 This rebuttal evidence responds only to the pre-circulated written evidence and statements received from submitters prior to the hearing. Other submitters may present oral evidence or further details at the hearing, which may raise additional matters that could influence or alter the recommendations made in this rebuttal evidence. Except as expressly identified in this statement, all findings and recommendations contained in my original Section 42A report remain unchanged.

2.0 Qualifications, Experience and Code of Conduct

2.1 My qualifications and experience are set out in paragraphs 5–10 of my Section 42A Report. I repeat the confirmation given in that report that I have read and agree to comply with the Code of Conduct for Expert Witnesses.

3.0 Responses to expert evidence

3.1 This section responds to submitter evidence in relation to the provisions in this topic. Appendix 1 sets out my revised recommended amendments in response to this evidence.

Rule THW-R1:

3.2 David Gibson, on behalf of S+SNZ seeks relief for THW-R1 and suggests an approach similar to that adopted through Wellington City Council's Plan Change 1.

3.3 Mr Gibson recommends that content equivalent to WCC's Appendix 17 (APP17)¹ be incorporated into the Hutt City Council Proposed District Plan (PDP). This would require consequential amendments to THW-R1 to refer to a new similar appendix as the relevant compliance standard.

3.4 S+SNZ made submissions on Three Waters rule THW-R1, under which the *2021 version of the Regional Standard for Water Services* is proposed to operate as a

¹ <chrome-extension://efaidnbmnnnibpcjpcglclefindmkaj/https://wellington.govt.nz/-/media/your-council/plans-policies-and-bylaws/district-plan/proposed-district-plan/files/plan-change-1/right-of-reply/appendix-a-to-right-of-reply---app17-three-waters-connections.pdf>

compliance standard. The submission opposed use of the RSWS 2021 for that purpose on the basis that, despite its title, the document is not drafted in a manner suitable for determining whether a new building and its connections qualify as a permitted activity.

3.5 The Commissioners may be aware that Wellington City Council addressed a similar issue through its 2024 District Plan change process by replacing reliance on the RSWS 2021 as a general compliance document with an appendix that identifies the relevant and specific parts of the RSWS 2021 with which compliance is required.

3.6 For the Commissioners' information, I understand the final version of the WCC appendix 17 was agreed between WCC, Tiaki Wai and S+SNZ.

3.7 The relief sought by S+SNZ is for a new appendix to be included in the Hutt City Council Proposed District Plan to replace reference to the full RSWS 2021 document. The new appendix is based on WCC Plan Change 1 Appendix 17 – Three Waters Connections (APP17), which is included as Appendix 2.

3.8 Following the conclusion of the Plan Change 1 hearings, WCC notified its decisions on 27 August 2026. I understand the updated framework no longer relies on the full RSWS 2021 as the operative compliance test and instead identifies the specific standards relevant to district plan implementation.

3.9 I consider that incorporating a specific appendix identifying the relevant RSWS 2021 requirements would improve the efficiency and effectiveness of THW-R1. This is because the appendix would provide a clearer and more certain permitted activity compliance pathway, rather than requiring applicants and reporting officers to interpret the full RSWS 2021. In my view, this would assist plan users, reduce ambiguity, and support more consistent implementation of the rule.

3.10 For these reasons, I recommend amendments to THW-R1 that refer to a similar appendix identifying only the relevant RSWS 2021 requirements. I do not support further amendments beyond those necessary to give effect to that approach.

3.11 For the following recommendation to incorporate a similar appendix to APP17 - I have named it Appendix 1.1 in the interim for reference only (Appendix 17 relates only to WCC plan changes). Appendix 2 outlines APP17 as it is drafted. I recommend THW-R1 is amended as follows:

THW-R1 *New buildings (excluding accessory buildings) and conversions of existing buildings in an Urban Zone – Connections to the Reticulated Network*

1. *Activity status: Permitted*

Where:

- a. Connection to the existing three water infrastructure achieves compliance with:
 - i. For wastewater: The level of service in ~~Chapter 5, section 5.2.3 of the Wellington Water Regional Standard for Water Services, December 2021, Version 3.0,~~ **Appendix 1.1 – Three Waters Connections**
 - ii. For water supply: The level of service in ~~Chapter 6, Tables 6.1 and 6.2 of the Wellington Water Regional Standard for Water Services, December 2021, Version 3.0,~~ **Appendix 1.1 – Three Waters Connections** and,
 - iii. For stormwater: ~~The performance standard in Chapter 4 of the Wellington Water Regional Standard for Water Services, December 2021, Version 3.0.~~ **Appendix 1.1 – Three Waters Connections.**

Note:

~~Chapter 4: Stormwater, Chapter 5: Wastewater and Chapter 6: Water Supply of the Wellington Water Regional Standard for Water Services, December 2021, Version 3.0, provide additional context for determining compliance with the references specified above.~~

4.0 THW-R2 – Hydraulic Neutrality

- 4.1 The S+SNZ submission seeks to amend rule THW-R2 such that hydraulic neutrality can be achieved for the development of up to three residential units by a range of stormwater management systems, and not only by using the “pre-approved” systems outlined by Tiaki Wai in their document “Managing Stormwater Runoff – The Use of Approved Solutions for Hydraulic Neutrality” (March 2024, Version 5).
- 4.2 The PDP Three Waters chapter, THW-R2 distinguishes between smaller and larger developments because smaller developments are generally expected to have lesser effects on the public stormwater network. S+SNZ is correct in identifying that the rules for development of 1-3 units do not allow a bespoke stormwater management system.
- 4.3 The submission by S+SNZ seeking bespoke stormwater management systems for development of up to three residential units as well for development of 4+ residential units is supported as it allows for further options, I view this amendment to be acceptable provided that hydraulic neutrality can be sufficiently achieved.
- 4.4 I recommend the following amendment to THW-R2:

**THW-R2 New buildings (excluding accessory buildings) in an Urban Zone -
Hydraulic neutrality**

1. **Activity status:** Permitted

Where:

- a. For development of no more than three residential units:
 - i. ~~The development incorporates a Wellington Water Limited approved solution for managing the rate of stormwater runoff.~~
 - i. *An approved hydraulic neutrality solution for managing the rate of stormwater runoff is incorporated; or*
 - ii. *The rate of stormwater released from the site does not exceed the modelled peak flows prior to the development.*
2. For development of four or more residential units, a retirement village, or a non-residential building:
 - i. ~~Stormwater management measures are incorporated which achieve post development peak stormwater flows which are the same or less than the modelled peak flows for the site before the commencement of the development.~~
 - i. *Stormwater management measures are incorporated so that the rate of stormwater released from the site does not exceed the modelled peak flows prior to the development.*

Notes:

An approved solution is one which meets the requirements of the ~~Wellington Water~~ **Tiaki Wai** Managing Stormwater Runoff – The Use of Approved Solutions for Hydraulic Neutrality, March 2024, Version 5.

Guidance for calculating peak stormwater flows to mitigate any increased flood hazard is contained in the ~~Wellington Water~~ **Tiaki Wai** Reference Guide for Design Storm Hydrology; Standardised Parameters for Hydrological Modelling, April 2019, Version 7.

Guidance on which storm events are to be managed is contained in Chapter 4 of the ~~Wellington Water~~ **Tiaki Wai** Regional Standard for Water Services, December 2021, Version 3.0.

For residential development of less than 10 residential units which meet the impervious area requirements of the ~~Wellington Water~~ **Tiaki Wai** approved solution, or a non-residential building less than 200m², a ~~Wellington Water Limited~~ **Tiaki Wai** approved solution for managing volume and rate of stormwater runoff installed on each unit can be used to achieve compliance with this rule.

- 4.5 For context, the PDP defines ‘hydraulic neutrality’ as ‘managing stormwater runoff from all new lots or development through either on-site disposal or storage so that stormwater is released from the site at a rate that does not exceed pre-development peak stormwater runoff.’
- 4.6 The Tiaki Wai document, ‘Criteria to Assess Approved Solutions for Residential Hydraulic Neutrality’ states that, approved solutions are accepted designs where

residential hydraulic neutrality is required, and that Tiaki Wai is the decision-maker for proposed approved solutions.

- 4.7 I note that WCC uses hydraulic neutrality as a district plan permitted activity and resource consent trigger, particularly through approved solutions for smaller residential development and engineered assessment for larger development. Greater Wellington's framework is broader again, addressing hydrological control, water quality, impervious surface effects and regional stormwater discharge consenting.
- 4.8 I therefore consider that the recommended approach is appropriate because it provides more distinct options to the applicant that proposed stormwater management measures will achieve hydraulic neutrality (and will not undermine relevant regional stormwater requirements).

5.0 Rule THW-R3 – Water Sensitive Design

- 5.1 The submission by S+SNZ opposed the use of the *Water Sensitive Design for Stormwater: Treatment Device Design Guideline* (December 2019) as a matter of discretion. This was on the basis that THW-R3.3 is aimed at large multi-unit developments, retirement villages and large non-residential buildings, while the guideline is said to be more suited to greenfield subdivisions than intensive housing developments.
- 5.2 I acknowledge S+SNZ's concern that the *Water Sensitive Design for Stormwater: Treatment Device Design Guideline, December 2019, Version 1.1* may include examples and treatment approaches that are more readily applied to greenfield subdivision, where there is greater ability to allocate land to stormwater treatment devices. I also accept that intensive housing developments may involve more constrained sites, where land is required for buildings, access, parking and servicing.
- 5.3 However, I do not consider that this justifies removing reference to the guideline altogether. THW-R3.3.1 does not require strict compliance with the guideline as a permitted activity standard (only refers to the relevant sections). Rather, the guideline is relevant as a matter that may inform the assessment of whether proposed water sensitive design measures are appropriate to the nature, scale, location and constraints of the development.
- 5.4 In my view, the important planning question is not whether a proposal uses a greenfield-style treatment device or a proprietary treatment device, but whether the proposed stormwater treatment approach will appropriately manage the effects of the development. This includes consideration of treatment performance, hydraulic effects, maintenance requirements, long-term operation, ownership and responsibility.

5.5 I also do not consider that the PDP should be interpreted as excluding proprietary stormwater treatment devices. Where a proprietary device can demonstrate that it will achieve the relevant stormwater quality and operational outcomes, it should be capable of being assessed through the consent process.

5.6 To address the submitter's concern, I support clarifying the matter of discretion so that the guideline is considered only where relevant and applicable to the site context, and so that alternative or proprietary stormwater treatment devices are not precluded where they achieve equivalent or better stormwater management outcomes.

5.7 The recommended wording would allow consideration of whether the proposed stormwater treatment measures are appropriate to the nature, scale, location and constraints of the development, having regard to relevant guidance, including the *Water Sensitive Design for Stormwater: Treatment Device Design Guideline* (December 2019), where applicable, and whether any alternative or proprietary treatment device would achieve equivalent or better stormwater management outcomes.

5.8 I recommend that the guideline is retained, but that THW-R3.3.1 is amended so it is clearly flexible, outcome-focused, and does not rule out proprietary devices. The amended wording also allows consideration of stormwater volume where relevant, while avoiding turning THW-R3 into a rigid stormwater volume-control rule.

5.9 ***THW-R3.3.1 - Matters of discretion are restricted to:***

~~1. The relevant sections of the [Wellington Water – Water Sensitive Design for Stormwater: Treatment Device Design Guideline, December 2019, Version 1.1.](#)~~

1. “The extent to which the proposed stormwater management and water sensitive design measures are appropriate to the nature, scale, location and constraints of the development, including their effectiveness in managing stormwater quality, runoff volume and discharge rate where relevant, having regard to the relevant sections of the Tiaki Wai ‘Water Sensitive Design for Stormwater: Treatment Device Design Guideline’, December 2019, Version 1.1, where applicable to the site context, and whether any alternative or proprietary stormwater treatment device or system would achieve equivalent or better stormwater management outcomes.”

5.10 The submission also opposed the inclusion of ‘ownership’ as a matter of discretion (THWR.3.3.4). I do not support that relief because discretion over ownership and management of water-sensitive urban design features is relevant to ensuring long-term functionality, assigning maintenance responsibility, and managing financial liabilities.

5.11 Mr Gibson is also concerned that Council is attempting to introduce stormwater volume controls. In my view, stormwater volume controls are a subset of stormwater management and usually relate to managing the amount of runoff generated or discharged from a site, not just the peak flow rate.

5.12 I acknowledge the concern that THW-R3 should not be used to impose a separate or undefined stormwater volume-control requirement where that is not clearly expressed in the rule framework. However, I consider that stormwater volume may be relevant where it forms part of assessing the effectiveness of water sensitive design measures and the management of stormwater effects from larger developments. Water sensitive design is not limited to treatment devices; it can also include measures that reduce, retain, reuse, infiltrate or detain stormwater runoff where appropriate to the site context.

5.13 Further, this does not duplicate THW-R2, which is directed to hydraulic neutrality and the **rate** of stormwater discharge. THW-R3 has a different focus, being the appropriateness of water sensitive design measures for larger developments, including stormwater quality, site constraints, long-term function, maintenance and potential cumulative effects. For that reason, I consider it appropriate for the matter of discretion to allow consideration of stormwater volume where relevant, provided the wording does not imply that a specific volume-control standard applies (unless such a standard is expressly stated). Refer to the amended matter of discretion in paragraph 5.9 above.

5.14 I consider that, if the PDP provides for alternative stormwater solutions, it is appropriate for the Hearing Panel to consider whether cumulative and long-term effects also need to be addressed.

5.15 For that reason, I do not support excluding stormwater volume considerations entirely, where those considerations may be relevant for water sensitive design effects of the activity and the purpose of the RMA.

6.0 New Objective to Protect the Waiwhetū Aquifer

6.1 Timothy Blackman on behalf of Tiaki Wai sought the following objective be added:

“Protect the Waiwhetū aquifer from the adverse effects of urban development and adverse effects of existing infrastructure.”

6.2 I do not disagree that the Waiwhetū Aquifer is a key source of drinking water for the region, and that protecting it supports the health, safety, and wellbeing of the greater Wellington region, including Hutt City.

6.3 I also accept Timothy Blackman's view that activities and land uses within the scope of Council's functions can affect the Waiwhetū Aquifer.

6.4 I have considered the core functions under section 31 of the RMA. Under that section, city and district councils, as territorial authorities, are required to control the use, development, and protection of land:

"31 Functions of territorial authorities under this Act

1. *Every territorial authority shall have the following functions for the purpose of giving effect to this Act in its district:*
 - (a) *the establishment, implementation, and review of objectives, policies, and methods to achieve integrated management of the effects of the use, development, or protection of land and associated natural and physical resources of the district:*
 - (aa) *the establishment, implementation, and review of objectives, policies, and methods to ensure that there is sufficient development capacity in respect of housing and business land to meet the expected demands of the district:*
 - (b) *the control of any actual or potential effects of the use, development, or protection of land, including for the purpose of—*
 - (i) *the avoidance or mitigation of natural hazards; and*
 - (ii) *[Repealed]*
 - (ia) *the prevention or mitigation of any adverse effects of the development, subdivision, or use of contaminated land:*
 - (iii) *the maintenance of indigenous biological diversity:*
 - (c) *[Repealed]*
 - (d) *the control of the emission of noise and the mitigation of the effects of noise:*
 - (e) *the control of any actual or potential effects of activities in relation to the surface of water in rivers and lakes:*
 - (f) *any other functions specified in this Act.*
2. *The methods used to carry out any functions under subsection (1) may include the control of subdivision."*

6.5 The RMA confirms the distinction between the functions of district councils and regional councils. I support the view that the PDP can protect aquifers through targeted land-use mechanisms within the matters identified in Section 31 of the Act.

6.6 Greater Wellington Regional Council addresses this issue through the Natural Resources Plan, including rule R-168, which makes construction and excavation activities deeper than 5m below ground level in the *Community Drinking Water Supply Protection Area* and the *Hutt Valley Aquifer Protection Zone* a discretionary activity. This rule controls higher-risk activities and provides clear standards for earthworks, water diversion, de-watering, and the discharge of water and contaminants.

- 6.7 I consider that the most appropriate mechanisms for safeguarding the confined Waiwhetū Aquifer are already in place through regional council functions. These include targeted depth restrictions, runoff management, site stabilisation, and controls on activities that could affect groundwater quality.
- 6.8 Within the PDP, EW-R1 provides a permitted activity pathway for minor earthworks, and EW-R2 provides for general earthworks only where the relevant standards are met. Where those standards are not met, including standards relating to area, cut height and fill depth, existing slope angle, transport of cut and fill material, and site reinstatement, resource consent is required.
- 6.9 The relevant standards include controls on the scale of earthworks, fill material, contamination risk, and erosion and sediment effects. These controls in the PDP complement the Natural Resources Plan, through general earthworks and three waters controls.
- 6.10 In my view, these targeted PDP controls provide a clearer and more certain planning response than a broad standalone objective because they identify the activities, effects (including cumulative effects), and consenting triggers relevant to managing 'land-use' risks to the aquifer. The approach is clearly set out in the introduction of the three waters chapter that states:
- 'Situated under the Hutt Valley is the Waiwhetū Aquifer. This aquifer is an important source of water for the Hutt Valley. The provisions that control development over the aquifer are contained within the Greater Wellington Regional Council's Natural Resources Plan, including the maps that identify the area where earthwork depths are managed. Any development that involves earthworks or piling over the aquifer will need to comply with the relevant rules to ensure that the aquifer is not impacted by site development.'*
- 6.11 Based on the above, I consider that a single new objective is unlikely to achieve Tiaki Wai's intended outcome unless it is supported by additional clear policies, methods, and rules that identify the relevant land-use risks and the Council functions through which those risks are managed.
- 6.12 My view remains that adding a single objective is not the most appropriate way to achieve the sustainable management purpose of the RMA, and that targeted earthworks and three waters provisions in the PDP addressing such identified effects provide a clearer and more effective planning response.

Appendix 1:

Provision	Submitter issue / evidence	Recommended amendment	Reason / evidential basis
THW-R1 – Three Waters infrastructure servicing standards	S+SNZ and Tiaki Wai raised concerns with using the full RSWS 2021 as a permitted activity compliance document.	Amend THW-R1 to refer to a new appendix 1.1, that incorporates the document referred to in the WCC PC1 decisions version as Appendix 17 (APP17) attached in Appendix 2.	This improves certainty and efficiency by avoiding reliance on the full RSWS 2021 (where only specific standards are needed for permitted activity compliance).
New appendix to support THW-R1	Tiaki Wai sought an approach similar to WCC's Plan Change 1 document referring to Appendix 17.	Insert a new appendix that has been updated to refer to the relevant RSWS 2021 requirements in the form of APP17.	The appendix approach provides a clearer and more specific compliance pathway for applicants and reporting officers that is most up to date (and aligns with the approach adopted through WCC's Plan Change 1 process).
THW-R2.1 and R2.2 – Hydraulic neutrality for smaller developments	S+SNZ sought a clearer permitted activity pathway (to incorporate bespoke stormwater solutions) for smaller residential developments.	Amend THW-R2 so that development of one to three residential units, may comply by incorporating a Tiaki Wai approved solution for managing stormwater runoff.	This provides a clear approved-solution pathway for smaller developments and avoids creating an open-ended bespoke design pathway at the permitted activity stage.
THW-R2 – Notes on approved solutions	The rule notes need to align with current entity names and the recommended	Update references from Wellington Water to Tiaki Wai where appropriate, and clarify that an approved solution means one	This improves legal and evidential consistency between the rule text, submitter evidence, and current terminology.

	approved-solution pathway.	that meets the requirements of ' <i>Tiaki Wai Managing Stormwater Runoff – The Use of Approved Solutions for Hydraulic Neutrality, March 2024, Version 5.</i> '	
THW-R3 – Water sensitive design	S+SNZ opposed the use of Tiaki Wai's reference to the ' <i>Wellington Water - Water Sensitive Design for Stormwater: Treatment Device Design Guideline, December 2019, Version 1.1</i> ' and opposed ownership as a matter of discretion. Included is the concern with stormwater volumes.	See paragraph 5.9 for the recommended amendment to THW-R3.1.	I consider that stormwater volume may be a relevant consideration where it forms part of assessing the effectiveness of water sensitive design measures and the management of stormwater effects from larger developments. This amended change considers volume where relevant, but avoids turning THW-R3 into a rigid stormwater volume-control rule. Ownership, management, and long-term maintenance of water-sensitive urban design features remain relevant matters for assessing functionality, responsibility, and potential liability.

Requested new objective – Waiwhetū Aquifer	Tiaki Wai sought a new objective to protect the Waiwhetū Aquifer from adverse effects of urban development and existing infrastructure.	Recommend no change. I do not support the insertion of the requested new objective regarding the aquifer.	Targeted provisions addressing specific land-use risks, including earthworks, stormwater, wastewater, hazardous substances, and groundwater-related controls are already provided for in the Natural Resources Plan (NRP) to protect the Waiwhetu Aquifer. Where district land use controls may affect the aquifer, this is a consideration for District Councils over the long term and cumulative effects. Hutt City Council provides appropriate land-use controls such as earthworks that provide a clearer and more effective planning response than a broad standalone objective.
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Appendix 2: WCC Appendix 17 (APP17)

In this Appendix:

- Text recommended to be added or deleted by Commissioner following submission and hearing process is underlined or ~~struck through~~ in green.

APP17 – Ngā Hononga Wai e Toru

APP17 – Three Waters Connections

Where this Appendix refers to Wellington Water Ltd, it also applies to any future entity that manages Wellington City's reticulated water, wastewater or stormwater networks.

1. Stormwater

1.1 Private Connections

1.1.1 Lateral connections to the existing public stormwater network The following applies to lateral connections to public mains:

1. Private connections must be a minimum size of 100 mm nominal diameter.
2. A vacant lot must be serviced by a separate connection to the public network.
3. Each proposed dwelling-residential unit on a lot must be serviced by a separate connection to the public system, except that:
 - a. Unit-titled developments are exempt from this criterion and may be serviced by a single, suitably-sized connection.
4. Each connection must be capable, as a minimum, of conveying the design level of service.
5. Industrial and commercial lots must have a minimum nominal diameter of 150 mm and must connect to a public stormwater pipe.
6. Connections provided to lots must be at sufficient depth so that they can be extended to the building platform in a manner compliant with the New Zealand Building Code.
7. Where the connection is to an empty lot, the terminal connection must be:
 - a. Laid at least 1 m inside and within the boundary of the property.
 - b. End in a method that can accept an approved spigot.
 - c. Pipe colour-coded green, ensuring that if paint is used any rubber ring gap is taped over to protect it from the paint.
 - d. Be blanked off or sealed with a removable cap colour-coded green.
 - e. Be marked with a securely embedded H4 treated timber post, with at least 600 mm protruding above ground, and the top 100 mm painted green.
8. Connections larger than 150 mm must be connected to the public system via a manhole only. Connections must be made at angles 90 degrees or less to the direction of the flow.
9. Connections 150 mm or less can be made directly to a stormwater main. ~~using one of the methods listed in Table 5 below.~~

Table 5 – Acceptable connection methods

Public main Material	Acceptable method
PVC	PVC Y-junction with rubber ring joint slip couplers
PE100	Electrofusion PE100 Y-saddle or Y-junction
Earthenware or concrete	Proprietary Y-junction with mechanical elastomeric metal banded couplers
Twin wall polypropylene	Twin wall polypropylene
AC and other pipe materials	AC and other pipe materials

- a. Connections must not be made to a public pipe deeper than 3.5 m to the crown, and instead:
 - i. A shallower public branch stormwater main must be provided to collect private connections before joining the deeper main at a manhole
- b. Connections must not be connected to the wastewater network.
- c. A private connection cannot cross an adjacent property without the permission of the adjacent property owner. Where permission is obtained, in writing, an easement must be obtained in favour of the connection's lot.

1.1.2 Lateral connections that require extensions/upgrades to the public stormwater network

In addition to the lateral requirements under 1.1.1, where a private connection to the public stormwater network requires an extension to, or upgrade of, the public stormwater network, the design requirements of 1.2 are also to be complied with.

1.1.3 On-site soakage stormwater disposal

Where an on site soakage system is proposed (i.e. no connection to the public network) the design requirements under section 1.2 are to be complied with.

1.2 General Requirements for 1.1.2 and 1.1.3

1.1.1 1.2.1 Climate change

All systems must be designed to accommodate the predicted impacts of climate change in terms of hydrology (refer to the Wellington Water Ltd Reference Guide for Design Storm Hydrology, which is available on the Wellington Water Ltd website) and design sea levels allowing for climate change and predicted land subsidence to 2130 as in Table 1 below.

Table 1 – Design sea levels allowing for climate change

Mean high water springs (NZVD2016) (m)	0.537 m
+ Projected sea level rise (m)	1.23 m
+ Land subsidence (m)	0.47 m (York Bay)
+ Barometric allowance (m)	0.25
= Design sea level (NZVD2016) (m)	2.49

1.1.2 1.2.2 Primary system level of service

The primary system typically comprises piped drainage systems, formed drainage channels and soakage systems. Each system is to be designed:

- a. To accommodate the design storm to a set level of service as defined by the annual exceedance probabilities (AEPs) listed in Table 2.
- b. To the General Catchment Level of Service, and then demonstrate that the roads, sections and other considerations internal to the catchment are not inundated when the general catchment is subjected to the assigned internal event for each consideration.
- c. The catchment is the entire drainage area above the design point of concentration.

Table 2 – Primary level of service (AEP)

<i>General catchment level of service</i>	
Residential	10%
Commercial/industrial	10%
Rural/rural residential	10%
<i>Internal level of service for roads</i>	
Primary arterial	1%
Secondary arterial	5%
Local/minor	20%
Bridges	2%
<i>Internal level of service for sections</i>	
Open space/reserve	50%
Private yards	50%
Car parks	20%
<i>Internal level of service for others</i>	
Where no secondary path is available	1%
Key public facilities, hospitals, substations etc.	1%
Wastewater disposal fields	5%

1.1.3 1.2.3 Secondary system level of service

The secondary system comprises secondary flow paths typically overland and along carriageway surfaces. The secondary systems must:

Table 3 – Secondary system level of service

Building floors	Design Storm Event (AEP)
Housing and communal residential and communal nonresidential	1%
Commercial	1%
Industrial	1%
Rural residential	1%
Roads	Design Storm Event (AEP)
Primary arterial*	1%
Secondary arterial*	5%
Local/minor*	20%
Bridges and major culverts	1%

* Flooding is allowed at these levels of service, but the road must be passable by light vehicles. The table below indicates acceptable depths and flow velocities as measured at the road centreline.

Table 4 – Maximum stormwater flow depths and velocities for access roads

	Max depth	Max velocity
Primary/secondary arterial road	0.1 m	2 m/s
Local/minor road	0.2 m	2 m/s
Steep local/minor roads	0.1 m	3 m/s
Walkways only	0.4 m	1 m/s

1.1.4 1.2.4 Secondary flow path

A secondary flow path is the path the stormwater would take if the primary drain was rendered inoperable or is overwhelmed by a flow exceeding the drain's design capacity. The secondary flow path must:

- Be shown on the submitted design and subsequent as-built plans, including demonstrating that existing and proposed dwelling-residential units are not affected by the secondary flow during the design secondary storm event.
- Include a secondary inlet (if required by Wellington Water Ltd) where the primary drain's capacity is large and the consequence of overflow is great (primary flow is greater than secondary flow path capacity).
- Convey the secondary system level of service event, less the design capacity of the primary system, regardless of secondary intakes.

1.2 Private Connections

1.2.1 Lateral connections to the public stormwater network

The following applies to lateral connections to public mains:

1. Private connections must be a minimum size of 100 mm nominal diameter.
2. Each proposed dwelling on a lot must be serviced by a separate connection to the public system, except that:
 - a. Unit-titled developments are exempt from this criterion and may be serviced by a single, suitably-sized connection.
3. Each connection must be capable, as a minimum, of conveying the design level of service.
4. Industrial and commercial lots must have a minimum nominal diameter of 150 mm and must connect to a public stormwater pipe.
5. Connections provided to lots must be at sufficient depth so that they can be extended to the building platform in a manner compliant with the NZBC.
6. Where the connection is to an empty lot, the terminal connection must be:
 - a. Laid at least 1 m inside and within the boundary of the property.
 - iii. End in a method that can accept an approved spigot.
 - a. Pipe colour-coded green, ensuring that if paint is used any rubber ring gap is taped over to protect it from the paint.
 - b. Be blanked off or sealed with a removable cap colour-coded green.
 - c. Be marked with a securely embedded H4 treated timber post, with at least 600 mm protruding above ground, and the top 100 mm painted green.
7. Connections larger than 150 mm must be connected to the public system via a manhole only. Connections must be made at angles 90 degrees or less to the direction of the flow.
8. Connections 150 mm or less can be made directly to a stormwater main using one of the methods listed in Table 5 below.

Table 5 — Acceptable connection methods

Public main Material	Acceptable method
PVC	PVC Y-junction with rubber ring joint slip couplers
PE100	Electrofusion PE100 Y-saddle or Y-junction
Earthenware or concrete	Proprietary Y-junction with mechanical elastomeric metal-banded couplers
Twin-wall polypropylene	Twin-wall polypropylene
AC and other pipe materials	AC and other pipe materials

1. Connections must not be made to a public pipe deeper than 3.5 m to the crown.
2. A private connection cannot cross an adjacent property without the permission of the adjacent property owner. Where permission is obtained, in writing, an easement must be obtained in favour of the connection's lot.

2. Wastewater

2.1 ~~Private Connections~~

2.1.1 Lateral connections to the existing wastewater network

The following applies to lateral connections to the wastewater network:

- a. A minimum nominal diameter for a lateral connection must be 100 mm.
- b. A vacant lot must be serviced by a separate connection to the public network.
- c. Each proposed ~~dwelling~~ residential unit on a lot must be serviced by a separate connection to the public main, except that:
 - a. Unit titled developments are exempt from this criterion and may be serviced by a single, suitably sized connection.
- d. Connections provided to the lots boundary must be at sufficient depth that they can be extended to the building platform in a manner compliant with the New Zealand Building Code.
- e. Minimum grades for private connections up to the property boundary must be as outlined in Clause G13 of the New Zealand Building Code, but with a minimum grade of 1:60.
- f. Laterals must be no ~~lower~~ deeper than 600 mm below ground level at the boundary.
- g. An inspection eye must be installed at the property boundary (on the public side of the boundary with the lot), comprised of either:
 - a. Proprietary inspection chamber with minimum 150 mm riser and screwcap fitting within:
 - i. Manifold box with red lid marked 'SS' in non-trafficable areas, or
 - ii. Ductile iron lamp-hole frame and cover on a concrete footing Or:
 - b. On steep property boundaries frontages with an exposed lateral pipe, the inspection eye may be replaced with a sealed inspection junction point.
- h. Connections must be made at a manhole in the following situations:
- i. Where the lateral connection is 225 mm or greater.
 - ii. Where the public main is identified as a trunk main, either on existing GIS network plans or as required by Council.
- a. Connections, must not be made to a public sewer pipe deeper than 3.5 m to the crown. ~~and instead:~~
 - a. ~~A lower public branch sewer must be provided to collect private connections before joining the deeper main at a manhole.~~
- b. Where the connection is to an ~~empty~~ vacant lot, the terminal connection must be:
 - a. Laid at least 1 m inside and within the boundary of the property.
 - b. End in a method that can accept an approved spigot.
 - c. Pipe colour-coded red, ensuring that if paint is used any rubber ring gap is taped over to protect it from the paint.
 - d. Be blanked off or sealed with a proprietary removable cap colour-coded red.
 - e. Be marked with a securely embedded treated timber post, with at least 600 mm protruding above ground, and the top 100 mm painted red.
- c. Allow for Gully traps to be installed at a level that:
 - i. prevents unwanted wastewater discharge by being a minimum of 150 mm above the nearest opening (e.g. manhole) in the wastewater network; and
 - ii. prevents stormwater inflow by being above the 1% AEP flood event level, or at the minimum clearance allowable by the New Zealand Building Code based on the overflow level of the lowest plumbing fixture.

- d. A private connection cannot cross an adjacent property without the permission of the adjacent property owner. Where permission is obtained, in writing, an easement must be obtained in favour of the connection's lot.
- e. The wastewater network must:
 - i. be of capacity suitable for carrying peak flows anticipated during the lifetime, without surcharge and with due allowance for ground and surface water infiltration and inflow; and
 - ii. adequately convey wastewater to an approved discharge point.

2.1.2 Lateral connections that require extensions/upgrades to the public wastewater network

In addition to the lateral requirements under 2.1.1, where a private connection to the public wastewater network requires an extension to, or upgrade of, the public wastewater network, the design requirements of 2.2. are also to be complied with.

2.2 2.1 General Design Requirements for 2.1.2

2.2.1 2.1.2 Level of service

The wastewater network must:

- a. Consist of an underground piped reticulation system where an adjacent public reticulation is available.
- b. Be of capacity suitable for carrying peak flows anticipated during the lifetime, without surcharge and with due allowance for ground and surface water infiltration and inflow.
- c. Be designed to minimise blockage and sediment deposition.
- d. Adequately convey wastewater to an approved discharge point.
- e. Not be connected to the stormwater network. Wastewater systems must be designed and constructed to minimise the risk and extent of stormwater inflow and infiltration.
- f. Be designed to prevent floodwaters entering the network where the wastewater network is within a flood plain, or secondary flow path.
- g. Allow for ~~G~~gully traps must to be installed at a level that:
 - a. prevents unwanted wastewater discharge by being a minimum of 150 mm above the nearest opening (e.g. manhole) in the wastewater network; and
 - b. prevents stormwater inflow by being above the 1% AEP flood event level, or at the minimum clearance allowable by the New Zealand Building Code based on the overflow level of the lowest plumbing fixture.

2.1.2.1 2.2.2 Population

The following applies to the population for wastewater design:

1. The population to be used for wastewater design in typical residential developments must be based on a people per dwelling-residential unit basis.
2. Where the proposed number of dwellings-residential units cannot be determined, the minimum density per hectare (ha), outlined in Table 6, must be adopted. **Table 6 – Residential development population density**

	Population per <u>dwelling</u> <u>residential unit</u>	Minimum density people per ha*
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Outside the City Centre Zone	3.1	General Residential Zone or Medium Density Residential Zone – 140 High Density Residential Zone – 400 Metropolitan Centre Zone, Local Centre Zone or Neighbourhood Centre Zone - 1200
City Centre Zone	3.1	400/ha of floor area**

* Gross area including streets but excluding reserves.

** Assuming 3 m between floor levels, the building heights at the height thresholds specified in CCZ-S1, and 80% site coverage. Ninth floors and above can assume 50% occupancy.

2.2 Private Connections

2.2.1 Lateral connections to the wastewater network

The following applies to lateral connections to the wastewater network:

- a. Each proposed dwelling on a lot must be serviced by a separate connection to the public main, except that:
 - i. Unit titled developments are exempt from this criterion and may be serviced by a single, suitably sized connection.
- b. Connections provided to lots must be at sufficient depth that they can be extended to the building platform in a manner compliant with the NZBC.
- c. Minimum grades for private connections up to the property boundary must be as outlined in Clause G13 of the NZBC, but with a minimum grade of 1:60.
- d. A minimum nominal diameter for a lateral connection must be 100 mm.
- e. Laterals must be no lower than 600 mm at the boundary.
- f. An inspection eye must be installed at the property boundary, comprised of:
 - i. Proprietary inspection chamber with minimum 150 mm riser and screwcap fitting within:
 1. Manifold box with red lid marked 'SS' in non-trafficable areas, or
 2. Ductile iron lamp-hole frame and cover on a concrete footing
 - ii. On steep property boundaries with an exposed lateral pipe, the inspection eye may be replaced with a sealed inspection junction point.
- g. Connections must be made at a manhole in the following situations:
 - a. Where the lateral connection is 225 mm or greater.
 - b. Where the public main is identified as a trunk main, either on existing GIS network plans or as required by Council.
- h. Connections, must not be made to a sewer pipe deeper than 3.5 m to the crown, and instead:
- i. A lower public branch sewer must be provided to collect private connections before joining the deeper main at a manhole.
- b. Where the connection is to an empty lot, the terminal connection must be:
 - i. Laid at least 1 m inside and within the boundary of the property.
 - ii. End in a method that can accept an approved spigot.
 - iii. Pipe colour coded red, ensuring that if paint is used any rubber ring gap is taped over to protect it from the paint.
 - jjj. Be blanked off or sealed with a proprietary removable cap colour coded red.

- kkk. ~~Be marked with a securely embedded treated timber post, with at least 600 mm protruding above ground, and the top 100 mm painted red.~~
- c. ~~A private connection cannot cross an adjacent property without the permission of the adjacent property owner. Where permission is obtained, in writing, an easement must be obtained in favour of the connection's lot.~~

3. Water Supply

3.1 Private Connections

3.1.1 Residential Service Connections

The following applies to residential service connections:

- j. Each residential dwelling unit, on a or vacant lot in a residential zone, proposed, anticipated or otherwise, must require be provided with a separate, single potable service connection from the public main up to and including the agreed point of supply.
 - i. Unit titled developments are exempt from this requirement in a) and may be serviced by a single suitably sized service connection.
- k. Front sections (or dwelling units residential units with individual street frontage) must have the point of supply located adjacent to the street boundary.
- l. For properties supplied from a public main in a right-of-way or private land, the service valves must be located in a shared property.
- m. Service valves (or meters) must not be located in driveways or on-site vehicle parking and manoeuvring areas.

3.1.2 Commercial Service Connections

Each commercial property on a or vacant lot, proposed, anticipated or otherwise, must:

- f. Require be provided with a separate, single suitably sized potable service connection from the public main up to and including the agreed point of supply
- b. Have the size, depth of cover and material of the service pipe and the connection comply with the requirements of Regional Specification for Water Services
- g. Include backflow prevention.

3.2 3.1 General Requirements

The following applies to all new private connections.

3.2.1 3.1.1 Functionality

The functionality of the water supply system must achieve the following:

- b. The network must provide firefighting flows and pressures in compliance with SNZ PAS 4509:2008, and during firefighting scenarios, the pipeline pressure in elevated areas of water distribution zone must remain positive.
- c. Customer Private connections must not be directly to a trunk main.
- d. Pressure to all customer the points of supply, in a reticulated network, must be provided by gravity from a public storage reservoir.

3.2.2 3.1.2 Levels of service

3.2.2.1 3.1.2.1 Network pressure

~~Pressures in the n~~Network pressure at the connection point must comply with the following clauses:

- h. The maximum pressure in any part of the water supply network must not exceed 90 m head of pressure.
- i. The minimum pressure available at the downstream outlet of the point of supply must not be less than 25m head of pressure measured from the bottom water level of the reservoir those set out in Table 7.
- j. ~~The minimum pressure must be the pressure available immediately downstream of the point of supply when the property is continuously drawing water.~~
- k. ~~The water supply network must be capable of providing the minimum levels of service at peak demand, as calculated in Section 3.3.1 Peak demand.~~
~~e.c. Where t~~The water pressure is must not be less than 10 m head of water at the final level on the building platform, ~~a private boosting pump station may be permitted provided pressures compliant with Table 7 can be achieved at the point of supply.~~
 - i. ~~Such pump stations must be sized so that they cannot deliver flows and pressures greater than the specified minimum levels of service at the final level of the building platform.~~
 - ii. ~~The pump station must be fitted with an approved double-check valve to prevent backflow from the property into the water supply.~~
 - iii. ~~A private booster station serving multiple lots must have the facility to connect a standby generator.~~
- f. ~~Fire suppression sprinkler systems (whether commercial or residential) may have a flow and pressure requirement greater than these minimum standards.~~
- g. ~~It is the designer's responsibility to demonstrate that the public network can supply the sprinkler system's flow and comply with all relevant standards.~~

Table 7 — Mandated levels of service for pressure at point of supply

Maximum pressure*	Minimum pressure**	Comment
90 m	25 m	10 m minimum pressure may be accepted for highest properties adjacent to reservoir

* Gauge pressure as measured at any point in the public network.

** As measured during peak demand flow assuming reservoir level is at the reservoir floor (bottom water level)

3.2.2.2 ~~3.1.2.2.~~ Reservoir volume

The water supply reservoir must have sufficient storage capacity to achieve the storage volume outlined in Table 8.

Table 8 – Mandated levels of service for storage volumes

Method	Storage (L/person)	Scenario
1	700	Where actual consumption is not known such as new developments
2	2 x Average Day Demand	Used when demand statistics are available from Wellington Water Ltd. The designer to target the greater of the volume determined by each method. Consult with Wellington

		Water Ltd to determine critical users and their consumption.
3	Maximum Day Demand + 20% + SNZ PAS 4509:2008 firefighting requirements	
4	(20 L/person/day for 23 days + critical users allowance) x 1.43	

3.1.2.3 Firefighting flows

Firefighting flows must be as outlined in the latest revision of SNZ PAS 4509. Compliant pressures must be calculated with the firefighting flows being delivered simultaneously during a two-thirds (2/3) peak demand period on a maximum demand day.

3.2 Private Connections

3.2.1 Residential Service Connections

The following applies to residential service connections:

- j. Each residential dwelling on a lot, proposed, anticipated or otherwise, must require a separate, single potable service connection from the public main up to and including the agreed point of supply.
 - i. Unit titled developments are exempt from this requirement in a) and may be serviced by a single suitably sized service connection.
- k. Front sections (or dwelling units with individual street frontage) must have the point of supply located adjacent to the street boundary.
- l. For properties supplied from a public main in a right of way or private land, the service valves must be located in a shared property.
- m. Service valves (or meters) must not be located in driveways or on-site vehicle parking and manoeuvring areas.

3.3 Commercial Service Connections

Each commercial property on a lot, proposed, anticipated or otherwise, must:

- b. Require a separate, single potable service connection from the public main up to and including the agreed point of supply
- c. Have the size, depth of cover and material of the service pipe and the connection comply with the requirements of Regional Specification for Water Services

3.3.1 Backflow Prevention

The following applies to backflow prevention:

- a. Where required, backflow preventers must be installed, appropriate to the hazard classification of the user type.
- b. The backflow prevention device must comply with NZBC and AS/NZS 2845.1.
- c. All commercial and industrial services must require a testable backflow preventer installed downstream of the service valve and meter and as close as practicable to the point of supply.

- ~~i. A second shut-off valve must be installed on the downstream side of the back flow preventer and meter to allow the backflow preventer to be isolated for maintenance purposes.~~
- d. ~~All fire service connections require a double check detector check backflow prevention device.~~
- e. ~~Requirements for access and easements must be considered.~~
- f. ~~Wellington Water, at its discretion, may also request additional backflow prevention to meet their obligations under the Health (Drinking Water) Amendment Act.~~